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SOCIO-CULTURAL INFLUENCES AND LEARNING CHANNELS.

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THE HYPOTHESIS THAT ENVIRONMENTAL CIRCUMSTANCES INFLUENCE THE PROCESS OF KNOWLEDGE ACQUISITION IS DISCUSSED. THE ROLE OF PARTIAL AND FULL SENSORY ISOLATION AND DEPRIVATION AND ITS NEGATIVE EFFECT ON LEARNING IS SHOWN TO BE SUPPORTED BY RESEARCH. THE INSTITUTE FOR DEVELOPMENTAL STUDIES AT NEW YORK UNIVERSITY IS ENGAGED IN RESEARCH DEALING WITH THE AUDITORY MODALITY DISCRIMINATION OF LOWER CLASS CHILDREN. THE AUDITORY MODE OF LEARNING FOR LOWER CLASS CHILDREN SEEMS TO BE LESS EFFICIENT THAN THE VISUAL MODE. REFERENCES ARE INCLUDED. THIS PAPER WAS PRESENTED AT THE INTERNATIONAL READING ASSOCIATION CONFERENCE (SEATTLE, MAY 4-6, 1967). (BK)

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Socio-Cultural Influences and Learning Channels

The topic on which I have been asked to write is really more in the nature of a hypothesis than an area of fact and interpretation. Since it is a hypothesis that I have previously advanced--and which I would still advance--I am pleased at this opportunity to discuss the issues involved.

First of all the hypothesis itself. Stated simply, it is that environmental circumstances are influential in the process of acquiring knowledge. This means that not only what one learns, but how he learns it is influenced by the social and cultural conditions under which he lives. Evidence has accumulated to show that, whatever portion of perceptual function may be innate, substantial portions are learned, or at least are modified by experience. This opens the way to consideration of what kinds of experience influence what aspects of perception and in what way.

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First is the question of quantity of experience. Animals reared in sensory isolation do not develop normal sensory processes. Similarly, in human beings sensory isolation produces lack or inadequacy of perceptual function. Of course, humans cannot be deliberately raised in conditions of sensory isolation, as can be done with animal experimentation. But there are some "accidents of nature" that have yielded data in this area, and there also have been series of experiments done with adult subjects experiencing isolation for varying periods of time. For example, von Senden reports the results of visual testing with subjects who, blind from birth or shortly thereafter, had successful eye operations and subsequently had vision. While the studies were not as controlled as one would wish for, and in many cases von Senden used anecdotal records, the burden of the evidence is that the people who had these experiences had serious visual perceptual deficits. In some cases, depending largely on the age of the subject, fully normal visual perception was never achieved. One function with which many of the subjects had difficulty is that called "thing constancy." This term refers to the ability to see an object as the same object no matter what its orientation in space or the angle from which it is viewed. One of the subjects von Senden reports, for example, could recognize an automobile easily when both he and it were on a level. But that same subject when looking out a window was not able to recognize the objects he was seeing from the top and had to go all

the way downstairs to satisfy his curiosity about what he was seeing: automobiles parked on the street. Similarly, some of the subjects reported did not acquire the ability to recognize geometric forms such as squares and triangles visually: they had to count the corners of the figures in order to designate them correctly.

Chimps raised in darkness, as reported by Riesen, showed serious perceptual deficiencies and apparently some of the animals never attained pattern vision.

These experiments all used subjects who were totally deprived of sensory experience in a particular channel for a period of time. Is it not logical to hypothesize that partial restriction might result in <u>partial</u> deficit? Such a partial deficit could take the form either of delay in acquisition of full skill, or of less-than-full development of skill, independent of time.

One type of restriction of sensory experience might simply be exposure to a more formless visual environment than is the typical one. Some very interesting experiments in this area are currently being done by Burton White. He studies institutionalized infants of mothers who are for one reason or another unable to care for them. These infants are kept in cribs in a nursery from six weeks of age until six months, and that is the period during which White and his colleagues have opportunity to study them and to modify their environment. The nursery is so organized that there are two facing rows of white cribs with an aisle between them. The babies are kept

on their backs, each in a crib, facing up to a white ceiling. The cribs are equipped with white sheets and white crib mats along the sides for bumpers, and the infants are attired in white diapers and white shirts. The investigator studied the age at which fisted swiping (hitting an object with the fist) and then reaching and grasping appeared. He found that for these infants, the average age for the former was 65 days, while for the latter it was 145 days. Then he introduced patterned sheets, removed the crib mats, and hung mobiles and stabiles from the crib. After this exposure, the age of fisted swiping for the experimental infants decreased to 55 days, while grasping appeared at 80 days. These experiments are examples of the basis for saying that early sensory experience can affect function.. While there is as yet no basis for saying that later perceptual functions are improved by an earlier appearance of these hand-eye skills, it would certainly seem that the earlier the basic skills appear, the earlier can they be built on by the later, more complex ones.

I should like to introduce another experiential element as well. That is, practice. Perception consists not only of recognizing a particular figure or object or sound, but also (and some theorists would say primarily) of being able to distinguish the difference between one object or sound and another. This function is called discrimination, and learning discriminations occupies a substantial portion of the literature. It is my thesis that the quantity of experience in making

discriminations influences the level of skill in discriminating. A child who has little practice in discriminating between two stimuli will not be able to do so as readily or as accurately as one who has had more experience. Here the quantity of stimulation reenters too: fewer stimuli mean fewer opportunities for differentiation. Too many stimuli may mean distraction and little opportunity for establishing discriminations.

Let us bring this down to a concrete example. A child who has, say, blocks to play with that are all of the same color and dimensions may have practice in handling and stacking blocks, but he will not have practice in distinguishing one size or shape from another. A child who has blocks of many sizes, shapes, and colors, with no consistent correspondence between size and shape, or either and color, will get practice in discrimination but so many variables will be involved that it is highly doubtful if he will become expert in distinguishing between two sizes or two shapes or two colors, because so many dimensions of the stimuli are varying simultaneously.

Social and economic circumstances influence the availability of stimuli in the environment of the child, and therefore, to the extent that this availability influences the perceptual development of the child, the socio-cultural factors have direct bearing on his perceptual functioning. (There are undoubtedly many indirect factors which are also influential, and some of these will be discussed later.) An obvious channel of influence is the number and variety of playthings

a child has, whether these be commercially available toys, homemade objects, or household objects. Generally speaking, a family which has barely enough money for food, shelter, and minimal clothing will not provide a variety of playthings for its children. Similarly, it will live in crowded quarters, and the child will probably get much less opportunity to compare similar objects and thus practice their discrimination than will be the case for the child from more favorable circumstances. This will be true for stimuli in all modalities.

The work of my colleagues and myself has centered mainly on the delineation and test of this hypothesis in the auditory modality. I hypothesize that a child in the noisy slum environment gets less practice than the child in the quiet middle-class environment in making discriminations between speech sounds. This would be because the child in the slum environment has much noise to interfere with his perception of a given sound and at the same time, has less verbal signal directed toward him. (This last point tends to be borne out by language research.) While one can avoid seeing particular visual stimuli by closing the eyes or turning the head, so simple an avoidance is not possible for auditory stimuli: we cannot close our ears. The way in which we avoid auditory stimuli is by "tuning out" their perception centrally. The problem with this characteristic is that the signal--the stimulus which has meaning and information--is tuned out along with the noise. Thus, it could be postulated, a noisy

environment promotes more tuning out, and the child as a result not only is exposed to less speech, but perhaps hears a smaller percentage of what he is exposed to than would be the case for his middle-class counterpart.

This hypothesis is under test at the Institute for Developmental Studies at the present time, but results are not yet available. However, Clark (1966) reports finding differences on the Wepman test of auditory discrimination between Headstart (lower-class) children and those of the same age attending a private nursery school. If our current research provides similar support, then an inroad will have been made into the difficult area of defining the nature of operation of the effects of socio-cultural factors on psychological development.

I have stated this central hypothesis elsewhere, with more supporting theoretical material. Now, however, let me go one step farther, into modality comparisons. It would seem reasonable, given the nature of the auditory tuning-out process, that the child from the slum environment would get proportionately less practice in auditory discrimination than he would in visual. If so, he might be expected to be somewhat poorer, overall, in obtaining information through the auditory than through the visual channel.

This is a very difficult area to investigate, because of the practical impossibility of establishing equivalent tests for different sense modalities. However, there is a body of data on presumed equivalents, and since the data come from different sources, and from

different measuring instruments, a modicum of cross-comparison is possible, with the resulting enhancement of the potential meaning of the findings.

Katz and Deutsch (1963) report that, contrary to most learning studies with middle-class children, retarded readers from the lower - class group consistently have more difficulty with the auditory channel than with the visual, on a variety of tasks. This is true for learning tasks and for reaction-time and/or vigilance tasks. At the same time, we are finding that, on the Illinois Test of Psycho-linguistic Abilities, lower-class children seem to have greater difficulty with subtests tapping auditory input channels, as compared with those presenting information visually. (The exception here in our data is the digit span subtest, which tends to be one of the best for these subjects, but, of course, for which the stimuli are very familiar to the children.) Klaus and Gray ( ) report similar findings for their group of socially disadvantaged children. Inspection of the data for the standardization group of the test does not yield the same finding. Further tests of this initial finding are planned.

It should be stressed that this emphasis on the relatively lower efficiency of the auditory channel for these children carries no intrinsic,,anatomic, or structural implication. The hypothesis about the findings rests on the interaction of the process by which experience influences perception and the nature of audition as compared, for example, to vision.

The potential ramifications of such a finding for education are,

of course, substantial. A great deal of classroom work proceeds via oral instructions from teacher to students; further, these instructions are likely to be in a somewhat more complex language system and/or in a different accent than that with which the disadvantaged child is familiar. Under such circumstances, closer attention is necessary; instead the child may actually be giving less attention.

Even more relevant for the present meeting is the fact that auditory perception and discrimination are very closely bound up in reading. We have found consistently, and have reported (e.g., P. Katz and M. Deutsch, 1963) that retarded readers are poorer on auditory discrimination tasks than are good readers of the same social class level. Younger children show more pronounced differences here than do older children, and the inference is that auditory discrimination is a skill that can mature, even in the presence of reading disability. The greater prevalence of reading disability in disadvantaged children leaves one with the question of how much of this increased prevalence might be attributable to greater difficulty in auditory discrimination tasks.

There are as yet no data to prove or disprove such a speculation. But the question is open to investigation.

It is hoped that this brief discussion has been illustrative of the manner in which socio-cultural factors might be related to learning channels--and of the fact that much meaningful work can be done in these areas.

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